

A Resource Use Primer

Introduction

This report is intended to serve as an educational primer related to the Wisconsin Health Information Organization (WHIO) data mart, with examples of its early use by the Wisconsin Collaborative for Healthcare Quality (WCHQ) and Wisconsin Medical Society (Society). The two organizations are using this important asset to understand the resources needed to provide healthcare for patients in Wisconsin. As they address resource use around a specific disease or condition, WCHQ and the Society start with high level data such as that presented in this report. This report shows there are differences in resource use; however, additional work needs to occur to understand what causes these differences and how to reduce the overall cost of care without adversely affecting quality.

This report includes a basic overview of the WHIO data and gives some suggestions regarding data interpretation. The overview is then followed by four sections that highlight how the WHIO data can be applied to different disease conditions. Each section covers a distinct disease area, and the sections are written in a manner that allows them to stand apart from the rest of the document. Overall, this report is intended to give the reader a better understanding of WHIO data and how it can be used to further explore resource use variation in Wisconsin.

WHIO Data Overview

As illustrated by events occurring on both the national and state levels, the cost of healthcare is increasing. Increases are being driven in part by an aging baby boomer population that will require greater overall medical services as they move into retirement and beyond, as well as advanced medical technology that is more expensive than previous technologies. As a result, it is necessary to begin thinking about how to most efficiently use the healthcare resources that we have to ensure everyone will have access to appropriate high quality healthcare in the future.

The first step to reducing healthcare cost is to determine where areas of resource overuse and underuse exist. Until recently, determining the statewide distribution of resources and healthcare cost was difficult, largely because information about resource use was held by individual hospitals, physicians and insurance companies. In 2005, WHIO was formed to serve as a data warehouse for resource use information. Most large insurance companies in the state, along with the Wisconsin Medicaid program, now submit de-identified health insurance claims data to WHIO. WCHQ and the Society use this data to identify where variation in resource use and cost exists and where healthcare dollars might be spent more efficiently.

WHIO has partnered with OptumInsight (formerly Ingenix) to develop a methodology to calculate and report on the relative resource use of millions of patients, physicians and other

healthcare professionals throughout Wisconsin. Here are some important facts about the WHIO data:

- The WHIO data is based entirely on health insurance claims data and is susceptible to any irregularities that may accompany the billing process. While the WHIO data generally captures services that a patient received, it does not contain clinical data used by physicians and other healthcare professionals.
- The WHIO data currently includes data provided by the following insurance companies: WPS Health Insurance Corp., WEA Trust Insurance, Humana, Anthem, United Healthcare of Wisconsin, State of Wisconsin Medicaid (FFS and HMO), Gundersen Lutheran Health Plan, Dean Health Plan, Security Health Plan, MercyCare Health Plan, Group Health Cooperative of South Central Wisconsin, Network Health Plan, and Physicians Plus Insurance Corporation. Combined, this data represents claims from more than 3.7 million Wisconsin residents. While the WHIO data represents about two-thirds of the Wisconsin population, some regions have less representation of their citizens.
- WHIO does not currently contain data submitted from the Centers for Medicare & Medicaid Services on the Medicare population. As a result, resource utilization is likely underrepresented for chronic diseases such as asthma, hypertension and diabetes and for conditions primarily affecting people over age 65. Any Medicare data represented in the WHIO data mart is in the form of supplemental Medicare claims submitted by other insurers.
- WHIO and OptumInsight use Episode Treatment Groups (ETGs) to define episodes of care, which are the primary method for assigning resource use to both patients and the providers who treat them. For example, if an individual goes into a clinic and is diagnosed with acute bronchitis, all of the charges for associated office visits, lab tests, radiology procedures, pharmaceutical orders and any other medical resources that are affiliated with that bronchitis diagnosis will be assigned to this patient. Each ETG is initiated by a diagnosis and office visit, and concluded by a predetermined clean period where no procedures or services related to that ETG are performed. For example, in the case of acute bronchitis, a patient's record would have to be void of bronchitis-related procedures for 30 days for the episode to conclude. In the case of chronic diseases, such as diabetes or asthma, an episode of care lasts for a 12-month period.
- WHIO and OptumInsight use a standardized pricing methodology, which allows resource use to be compared across organizations that submit their data to WHIO. Standardized pricing is designed to remove variation that may arise due to differences in healthcare professionals' charges, contractual arrangements, geographic regions, timeframes of data and the healthcare settings from which the services are provided. Quite simply, this means that in the WHIO data mart the cost of a unit of care is calculated the same way no matter where it is received or who provides it. As a result, the standardized cost that

is represented throughout this report reflects differences in the amount of services provided and not the actual cost or price of those services. Although the resource use is presented in dollars and cents, it should not be interpreted as an actual monetary value.

- Every episode of care is assigned a severity score based on patient characteristics and other illnesses a patient may have. The score is derived using such factors as age and gender, condition status, comorbidities, and the effect and interaction of multiple complications and comorbidities. Each episode of care is then assigned a severity level based on the distribution of severity scores across all episodes of care found within a single ETG. The lowest severity level indicates patients with a less severe disease, and the highest severity level includes the sickest patients or the most severe cases.
- In addition to representing resource use as a unit of standardized cost, resource use can also be represented as a ratio of observed-to-expected standardized cost in a cost index. The cost index is calculated by dividing the cost per episode of care for a group of physicians by the average cost per episode for all physicians of the same peer group in the state. In most cases a peer group is a provider specialty, such as internal medicine or cardiology. In addition, the cost index is case mix adjusted by severity level, whereas the standardized cost per episode is not. This makes the cost index more appropriate for comparisons between groups than the standardized cost number.
- The data in the following sections represents insurance claims from October 1, 2009 to September 30, 2010, and includes information on all physicians and hospitals in Wisconsin represented in the WHIO data mart, not just those who are part of WCHQ.

While it is our sincere hope that the WHIO data will begin to allow organizations to look specifically at where resources and cost can be saved, it is beneficial to first look at how healthcare resources are distributed in general across the state. The following data illustrates variation in resource use surrounding care in Wisconsin for the following areas of care:

1. Asthma
2. Diabetes
3. Hypertension
4. Pregnancy, with delivery

Asthma Care – Resource Use

Figure 1 illustrates the relative amount of resources used by family and internal medicine physicians to take care of patients with pulmonary conditions, as compared to the total healthcare resources expended in Wisconsin. The lower pie chart shows the relative amount of resources used for the care of asthma episodes compared with the total resource use for all pulmonary conditions.

Figure 1.

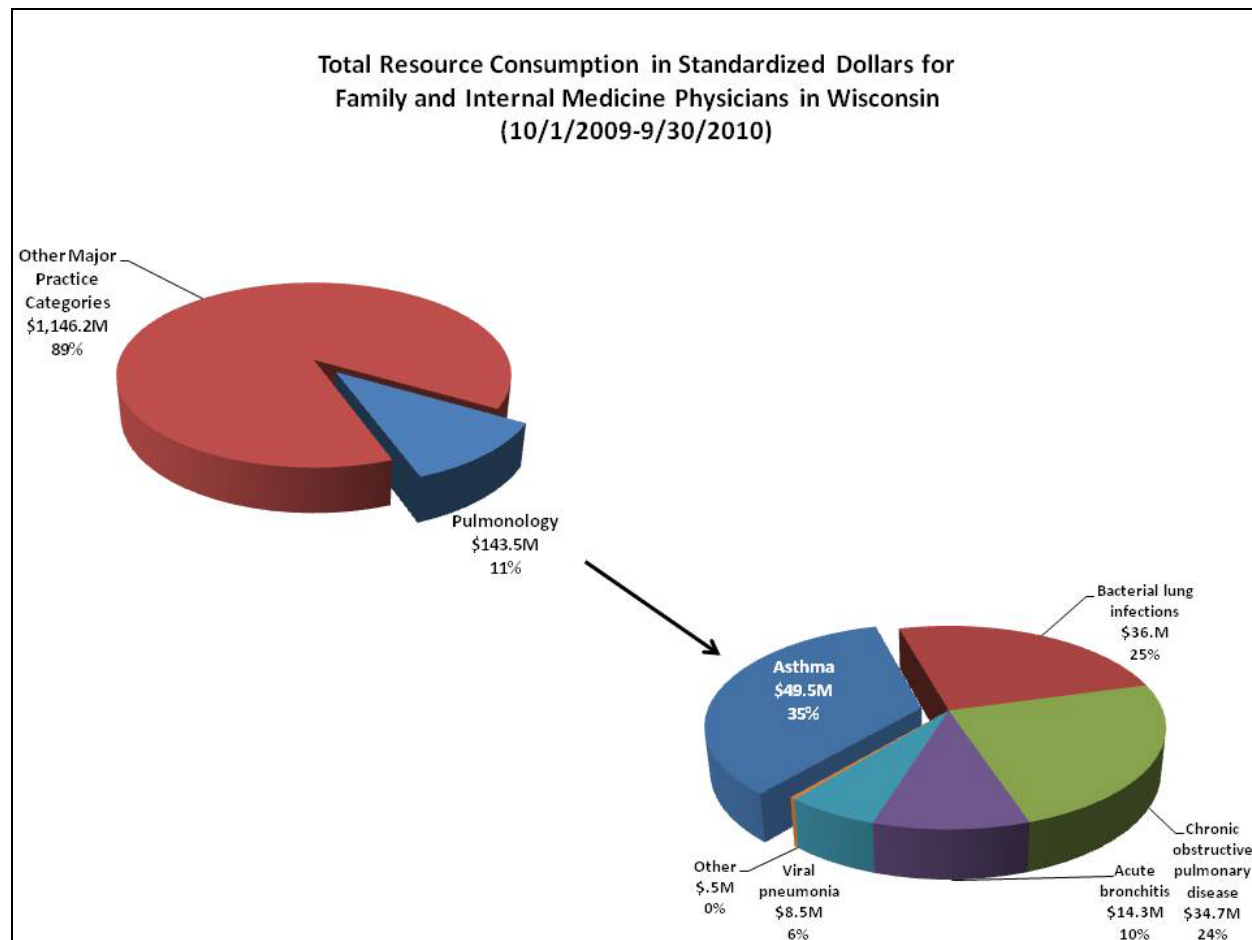
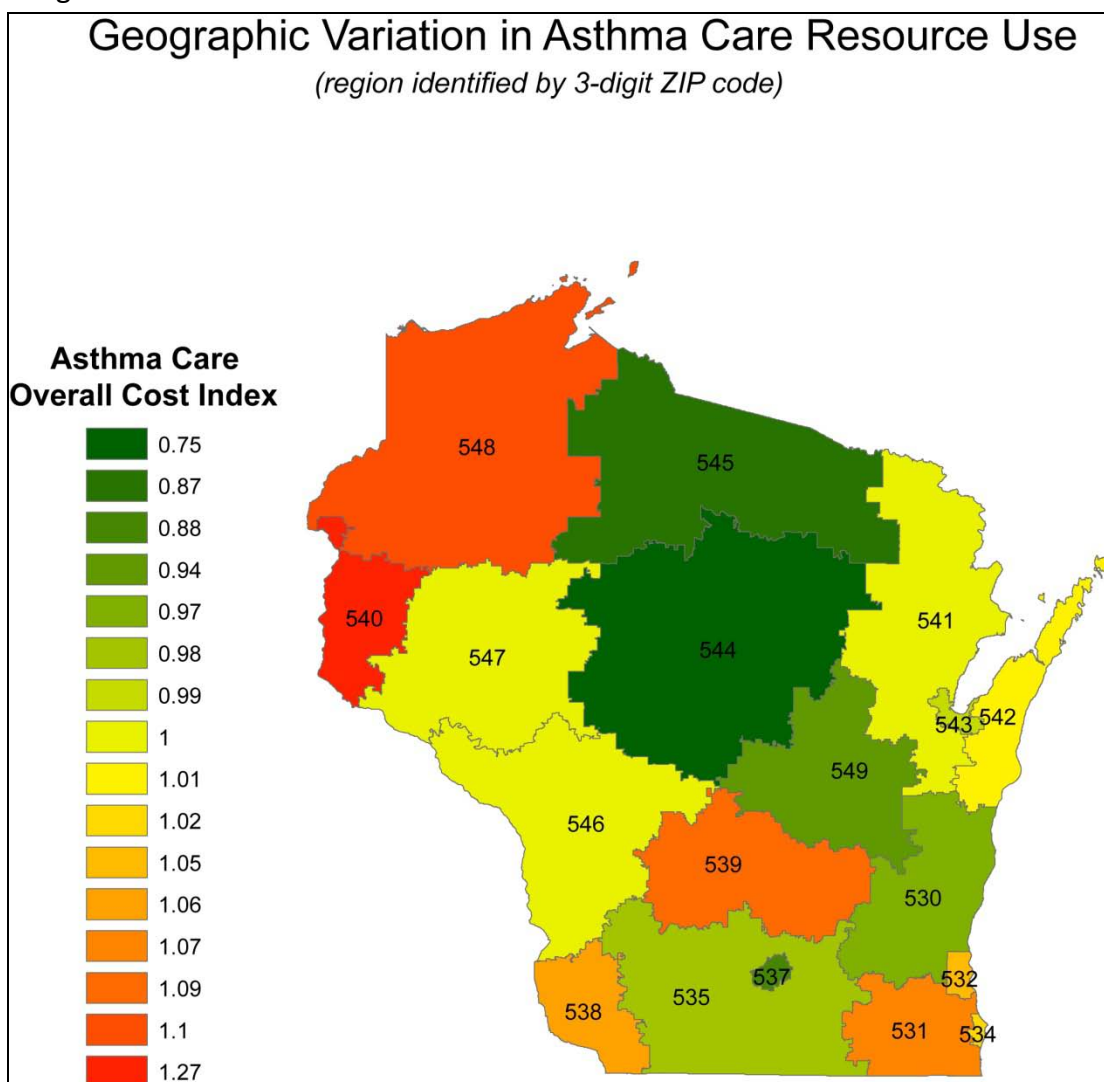


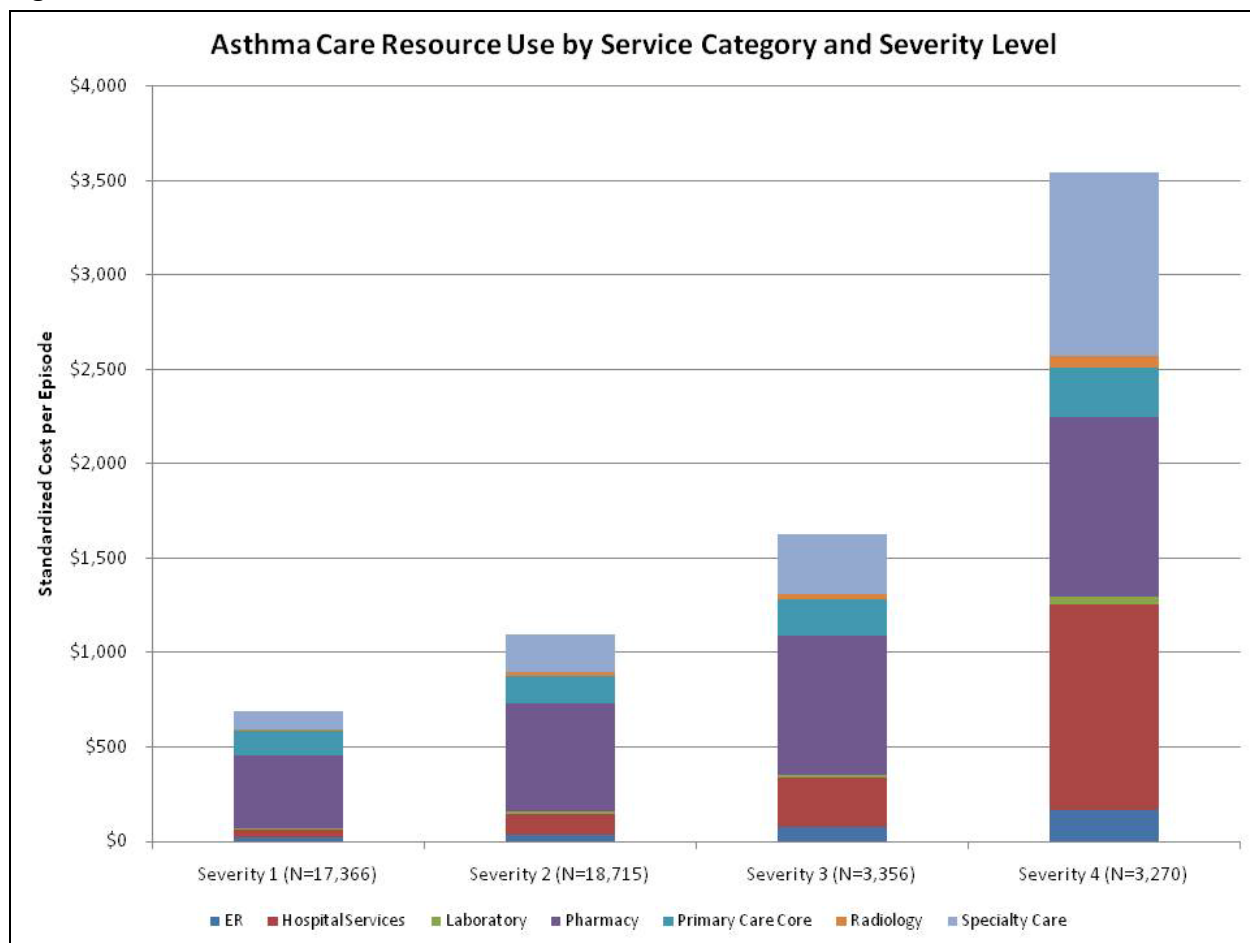
Figure 1 illustrates that close to 4 percent of state resources go toward asthma care. This proportion likely underrepresents resource use because the Medicare population with chronic obstructive pulmonary disease is largely missing from the WHIO data. Variations in the resources used to treat asthma are represented in the cost index number as shown in Figure 2. In the lowest utilization region physicians used 25 percent less resources than their peers, and in the highest utilization region physicians used 27 percent more resources than their peers. Many factors affect variation, including differences in the type and number of services provided and the amount of data available for each region.

Figure 2.



Disease severity is one of the primary factors impacting how many resources are used for an episode of care. Figure 3 shows the categories of resources used at each severity level for an episode of asthma care, with 7.7 percent of the episodes classified as the most severe episodes or severity level 4 and 40.7 percent classified as severity level 1, the least severe. Pharmacy resources account for most of the resource use in lower severity levels, while hospital services and specialty care are more heavily utilized in the higher severity levels.

Figure 3.



Diabetes Care – Resource Use

Like many chronic diseases, diabetes is a relatively resource-intensive condition. Individuals with well controlled diabetes often require frequent office visits and drug therapy, while individuals with poorly controlled diabetes experience complications that require specialty care and can result in hospitalization. Figure 4 illustrates that 20 percent of the relative resources used by internal and family medicine physicians are for diseases of the endocrine system with more than half of those resources going for diabetes care.

Figure 4.

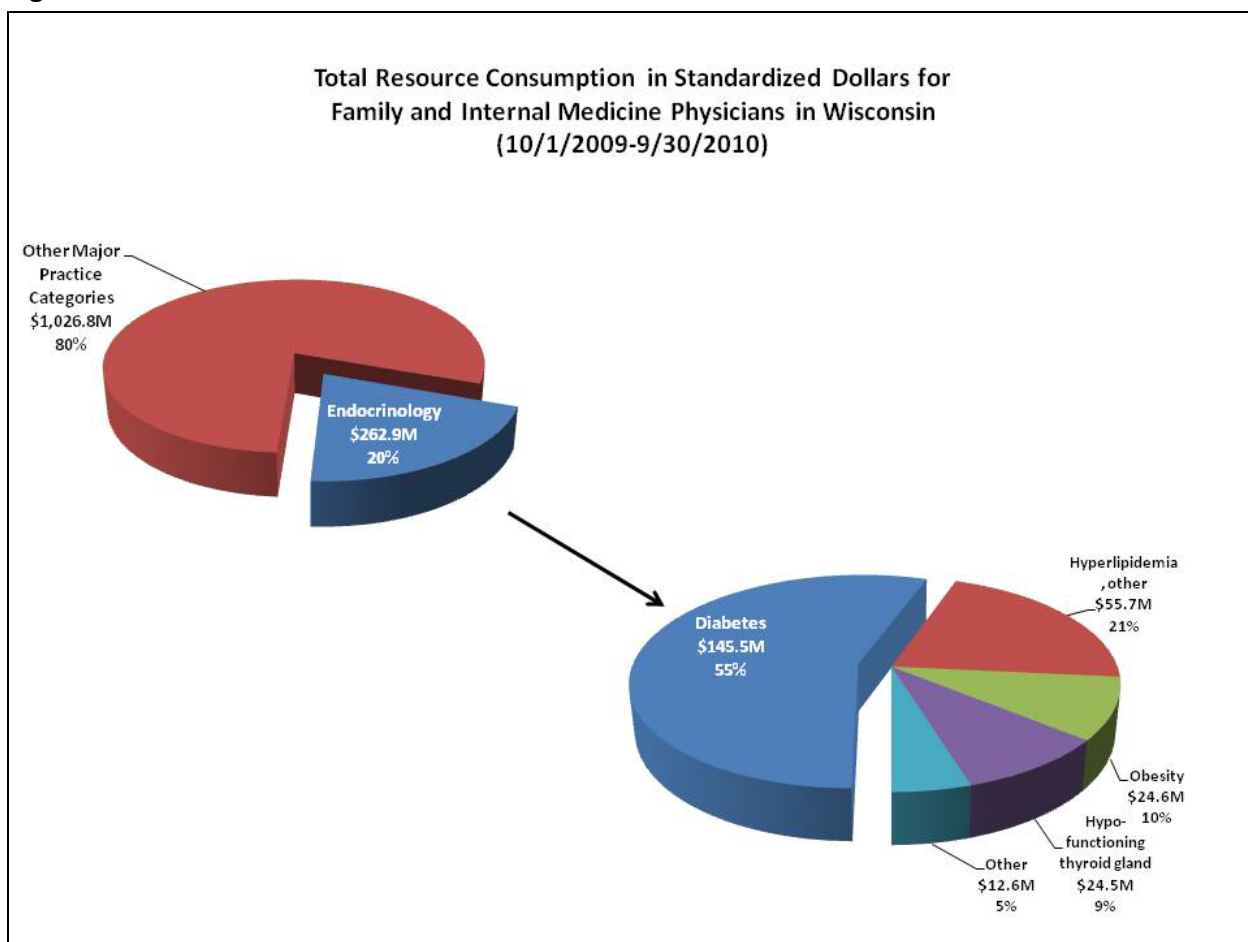
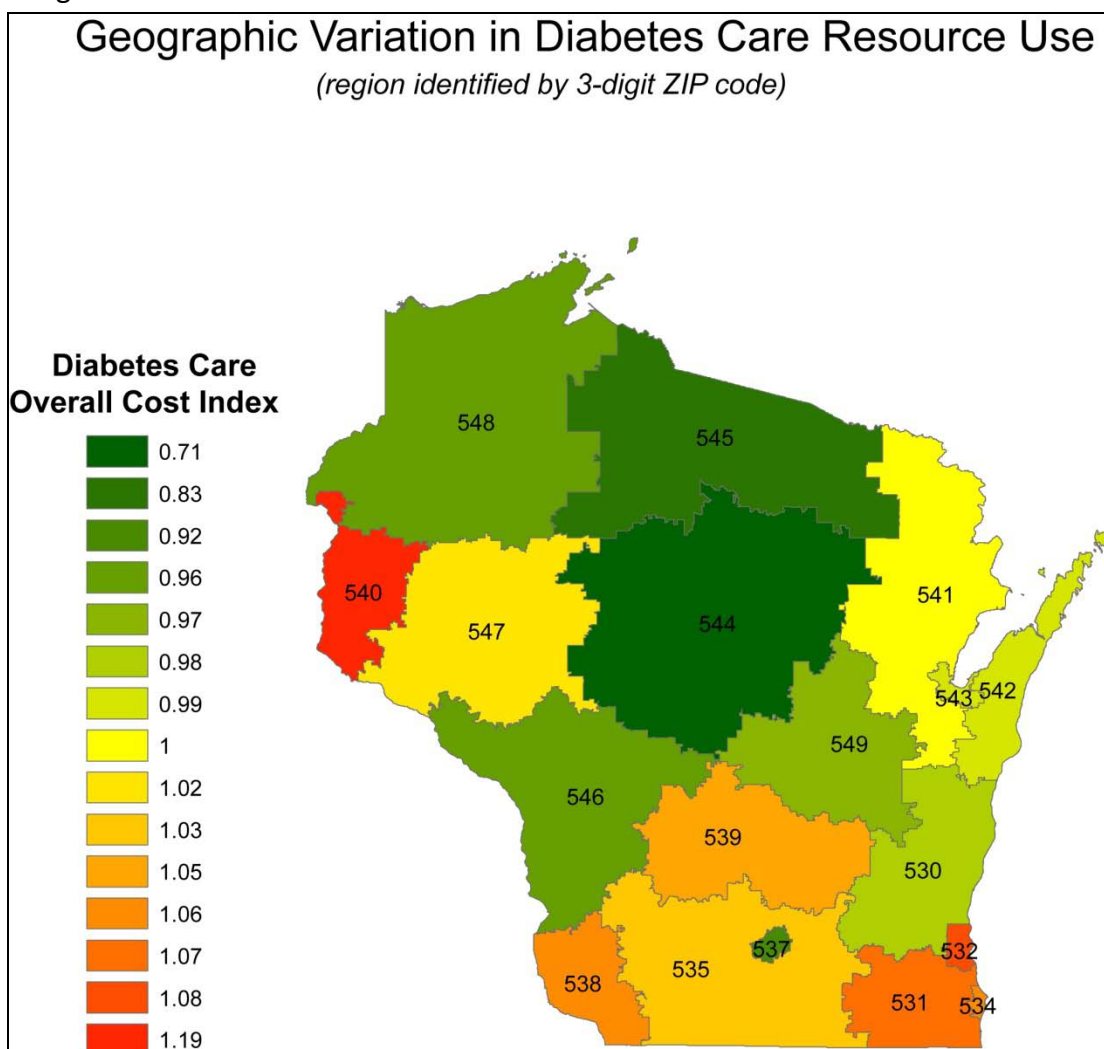


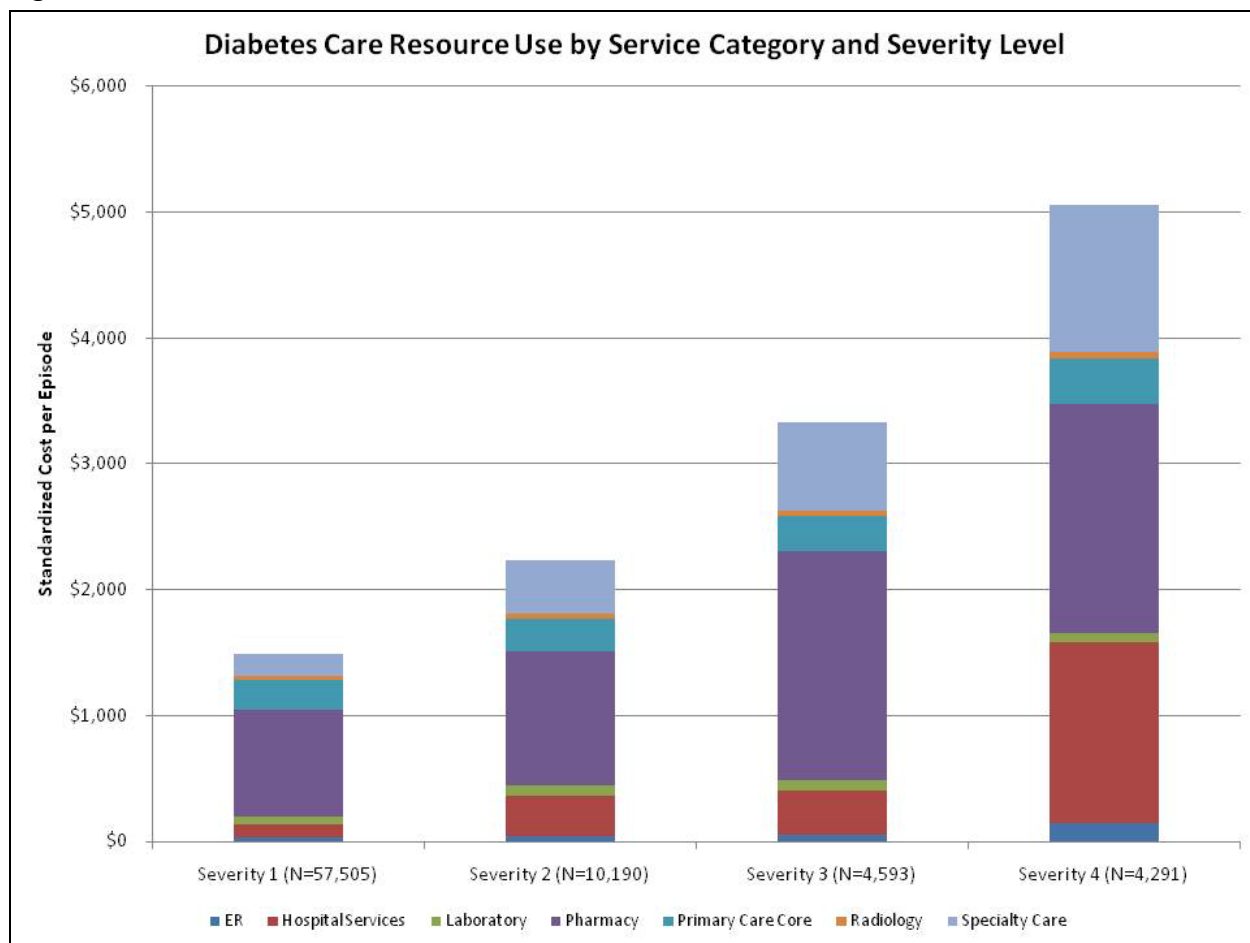
Figure 5 displays cost-index variation for the care of patients with diabetes across the state. In the lowest utilization region physicians used 29 percent less resources than their peers, and in the highest utilization region physicians used 19 percent more resources than their peers. Many factors may lead to variation, including differences in the type and number of services provided in a ZIP code region and the amount of data available for each region.

Figure 5.



Disease severity is one of the primary factors impacting how many resources are used for an episode of care. Figure 6 displays the average standardized cost of services at each severity level for an episode of diabetes care, with 5.6 percent of the episodes classified as severity level 4, the most severe, and 74.9 percent of the episodes classified as severity level 1, the least severe. In severity levels 1, 2 and 3, the primary driver of overall resource use is pharmacy resources; in severity level 4, there is a dramatic increase in both hospital services and specialty care utilization. Despite being a small proportion of the episodes, those individuals with severe cases of diabetes require on average more than three times as many resources as those with less severe cases.

Figure 6.



Hypertension Care – Resource Use

Figure 7 shows the relative amount of resources used by family and internal medicine physicians for the care of patients with cardiac conditions, as compared to total healthcare resources used by physicians in the state of Wisconsin. The lower pie chart shows that more than half of the resources used by family and internal medicine physicians for cardiac care are used to treat hypertension. In addition to consuming more than 10 percent of the total resources, hypertension is the most frequently treated condition by family and internal medicine physicians in the WHIO data mart, with more than 175,000 episodes statewide.

Figure 7.

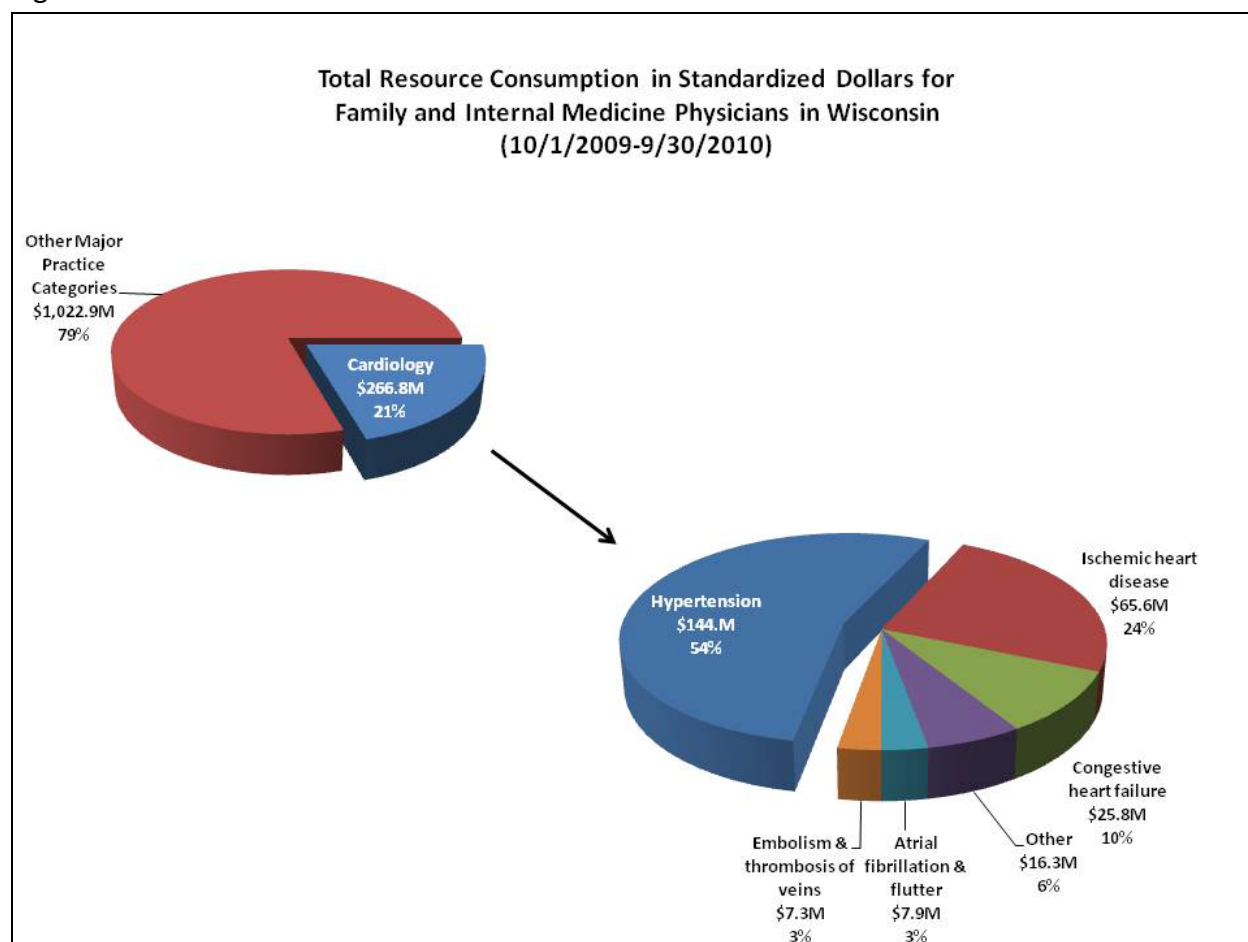
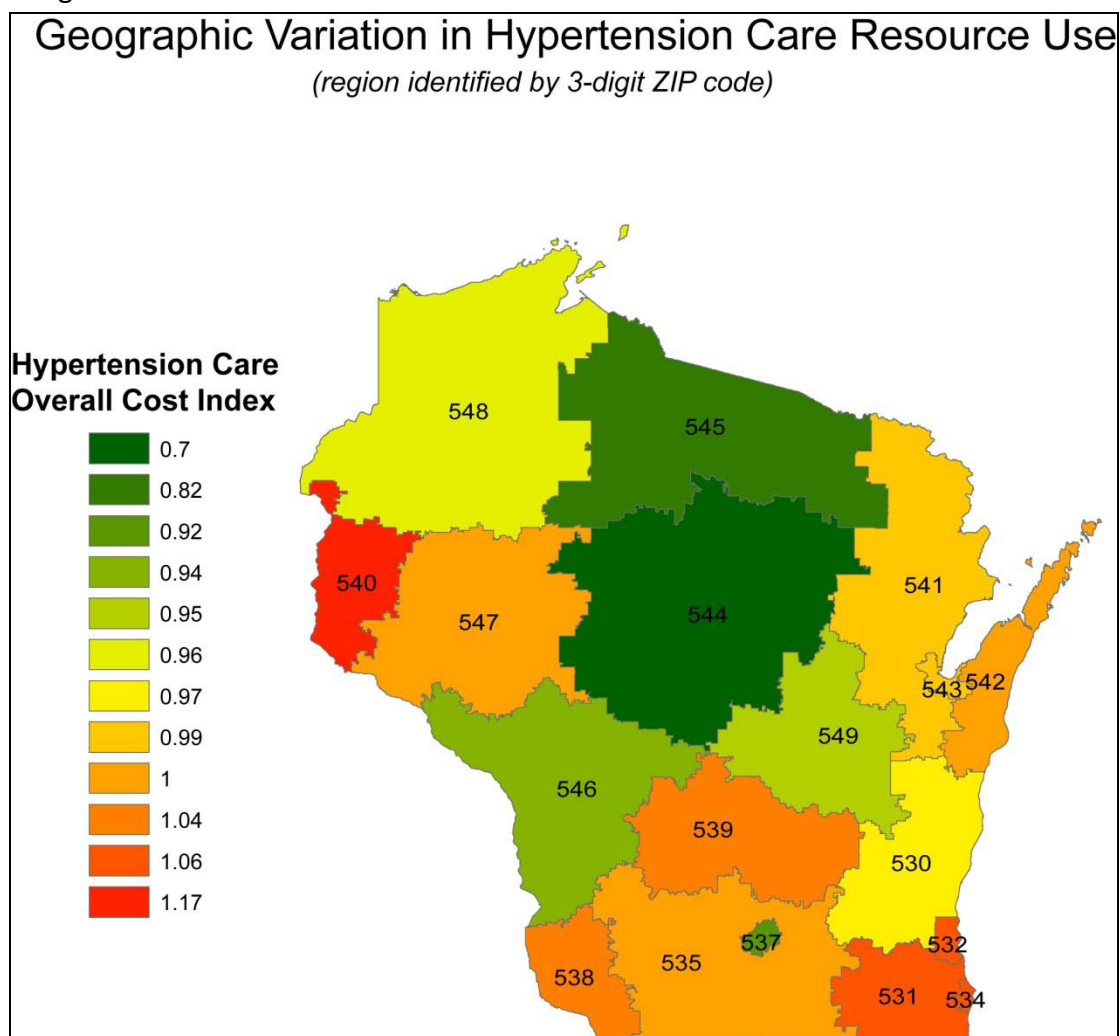


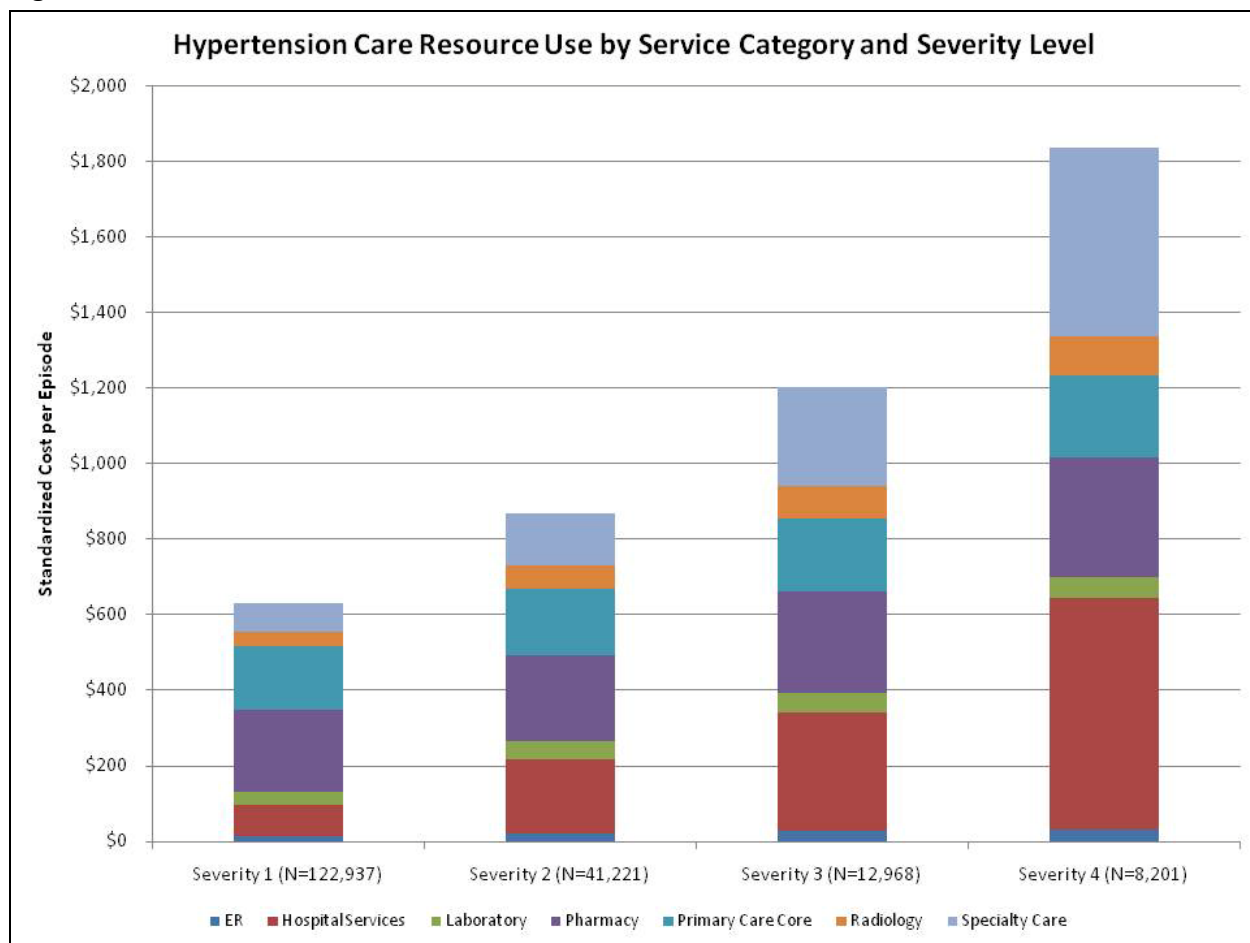
Figure 8 displays cost-index variation for the care of patients with hypertension in Wisconsin. In the lowest utilization region physicians used 30 percent less resources than their peers, and in the highest utilization region physicians used 17 percent more resources than their peers. Many factors may lead to this variation, including differences in the type and number of services provided and the number of claims contributed to the database in each region.

Figure 8.



Disease severity is one of the primary factors impacting how many resources are used for an episode of care. The bar graph in Figure 9 illustrates the average standardized cost of services at each severity level for an episode of hypertension care, with 4.4 percent of the episodes classified as severity level 4, the most severe, and 66.3 percent of the episodes classified as severity level 1, the least severe. In severity levels 1 and 2, the primary drivers of overall resource use are pharmacy and primary care services; whereas, in severity levels 3 and 4, hospital services and specialty care account for most of the utilization.

Figure 9.



Pregnancy (with Delivery) Care – Resource Use

Figure 10 illustrates the relative amount of resources used by obstetricians/gynecologists (OB/GYNs) for the care of patients with obstetric conditions, as compared to total healthcare resources used by those physicians in Wisconsin. More than 90 percent of the obstetric resources used by OB/GYNs are for pregnancy with delivery.

Figure 10.

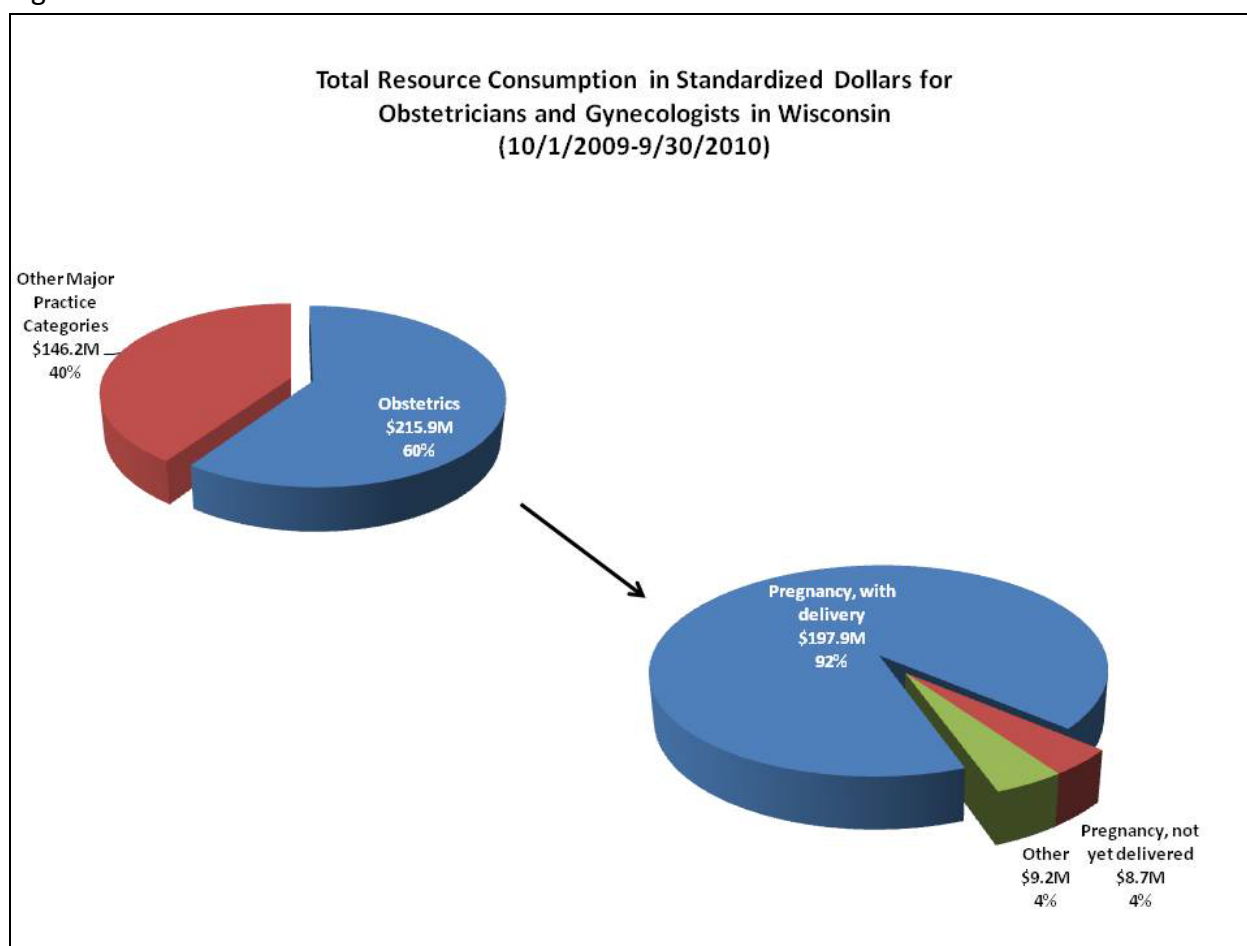
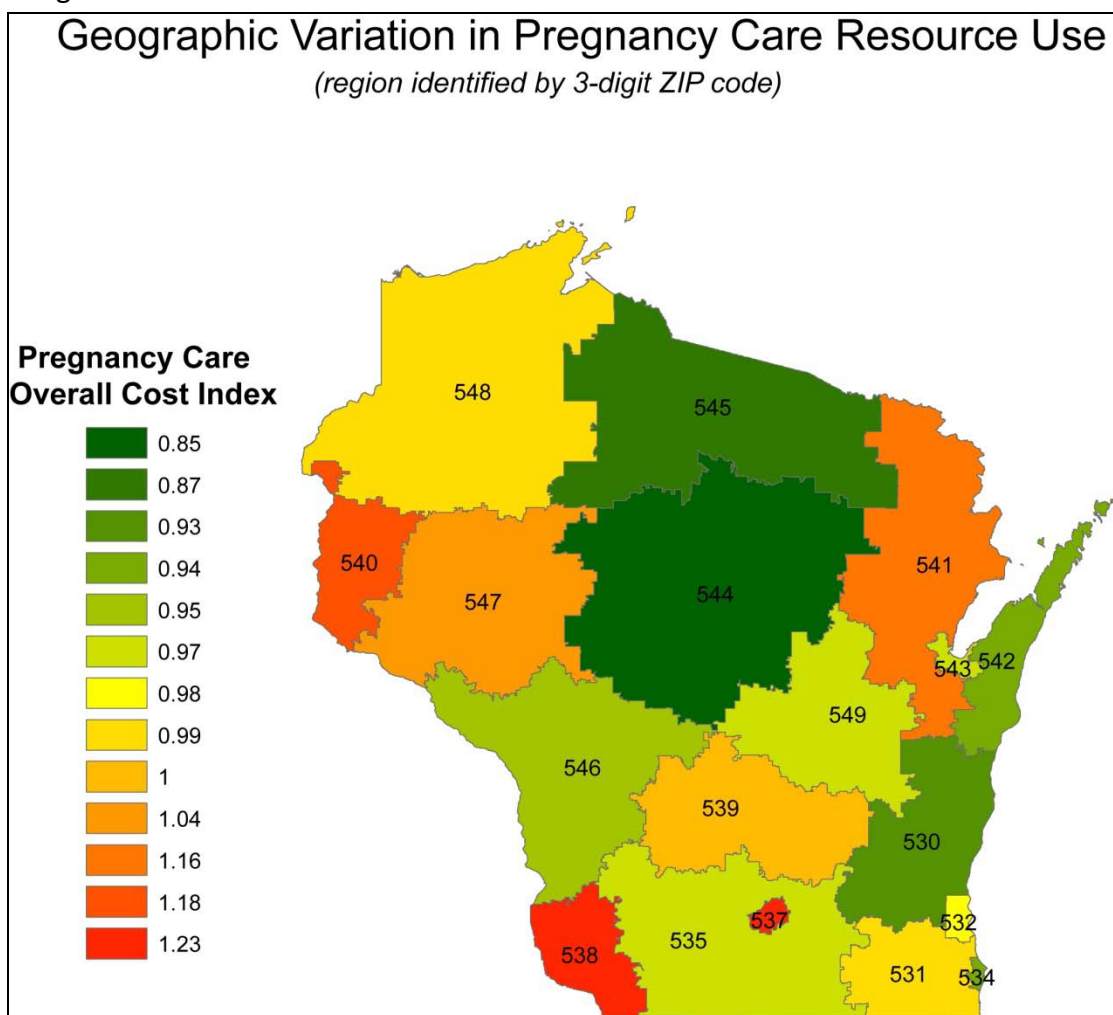


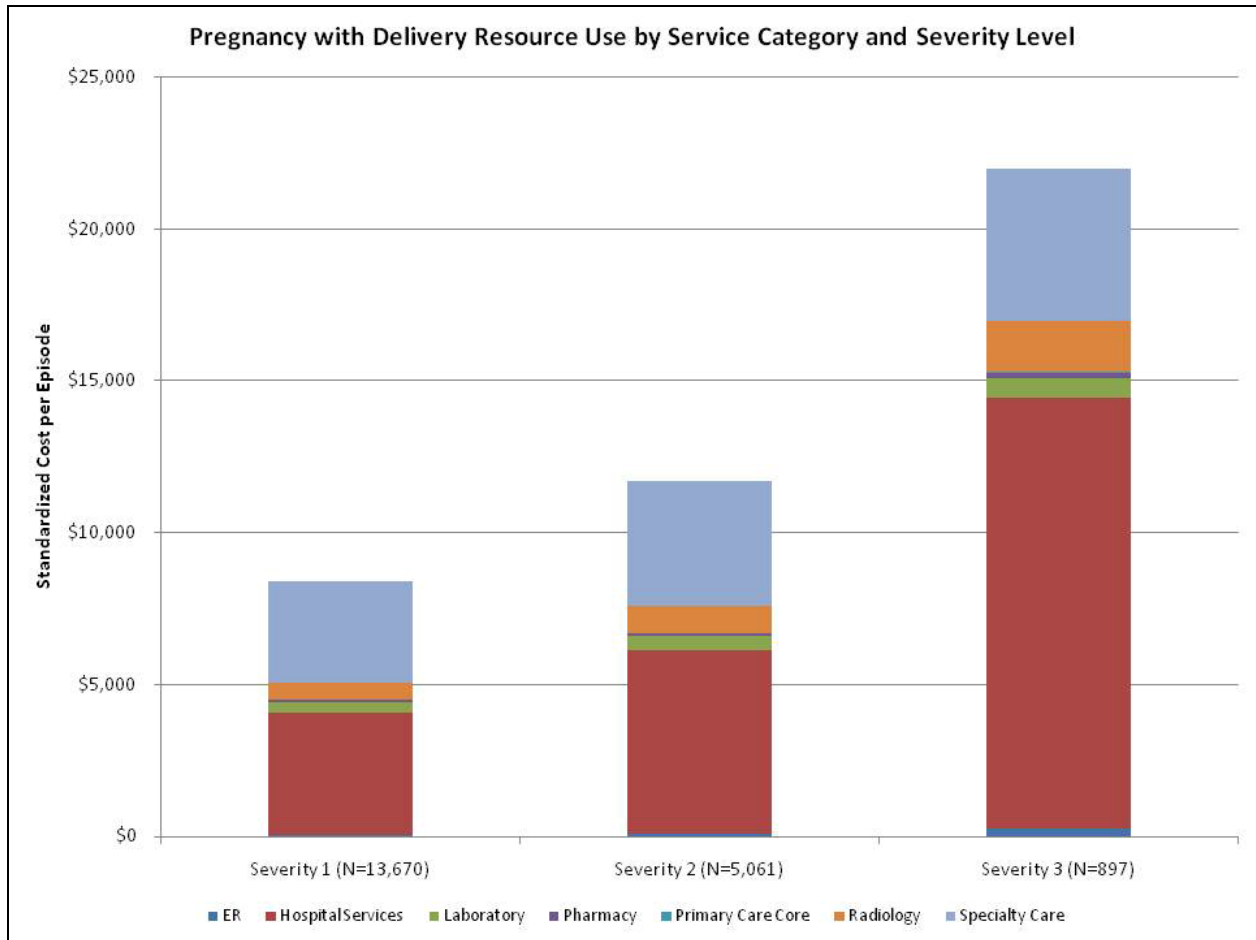
Figure 11 illustrates state variation in the pregnancy cost index. In the lowest utilization region physicians used 15 percent less resources than their peers, and in the highest utilization region physicians used 23 percent more resources than their peers. Many factors may lead to this variation including differences in the type and number of services provided in a ZIP code region and the number of claims contributed to WHIO from each region.

Figure 11.



Disease severity is one of the primary factors impacting how many resources are used for an episode of care. Figure 12 illustrates the average standardized cost of services at each severity level for an episode of pregnancy with delivery care, with 4.6 percent of episodes classified as severity level 3, the most severe, and 69.6 percent classified as severity level 1, the least severe. In all three severity levels, the primary driver of resource use is hospital services.

Figure 12.



Conclusions

This primer is intended to give readers a greater understanding of how resources for four clinical conditions are represented and characterized in the WHIO data mart. WCHQ and the Society are collaborating to find meaningful ways to use this type of data to improve healthcare utilization in Wisconsin. As the understanding of the WHIO data and the data itself mature, more refined analysis will be possible.

Disclaimer

The Wisconsin Medical Society (Society) and the Wisconsin Collaborative for Healthcare Quality (WCHQ) have created this report to provide health care cost and utilization information. The data source for this report is the Wisconsin Health Information Organization (WHIO) Data Mart Version 5 (DMV5) database, which the Society and WCHQ relied upon without audit. The collection and aggregation of all underlying data was undertaken by WHIO. The Society and WCHQ are not responsible for the accuracy or content of the underlying data contained in this report or for the concepts or methodologies contained in the software used in the analysis. Be advised of the possibility of errors in data collection or aggregation or in software concepts or methodology, which may affect the results found in this report. Use of the data or conclusions contained in this report for anything other than informational purposes is at the recipient's own risk.